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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,059	03/09/2005	Jean-Luc Dubois	034296-026	7000

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BUCHANAN, INGERSOLL & ROONEY PC  
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EXAMINER
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ZUCKER, PAUL A

ART UNIT	PAPER NUMBER
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1621

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/01/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary****Application No.**

10/527,059

**Applicant(s)**

DUBOIS, JEAN-LUC

**Examiner**

Paul A. Zucker

**Art Unit**

1621

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-29 and 37-39 is/are rejected.
- 7) ☒ Claim(s) 36,39 and 40 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

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| <p>1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br/>Paper No(s)/Mail Date <u>5/27/2005</u>.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)<br/>Paper No(s)/Mail Date. ____.</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application</p> <p>6) <input type="checkbox"/> Other: ____.</p> |
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## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities: A section headed : Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74 is required. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 17-25 are rejected as being unpatentable over Tadamitsu et al (JP 03-170445 07-1991, English translation).

Instantly claimed is a process for manufacturing acrylic acid from propane, wherein

a) a gaseous mixture devoid of molecular oxygen and comprising propane, water vapor is introduced into a first reactor with a moving catalyst bed; b) at the outlet of the first reactor, the gases are separated from the catalyst; c) the catalyst is returned into a regenerator; d) the gases are introduced into a second reactor with a moving catalyst bed; e) at the outlet of the second reactor, the gases are separated from the catalyst and the acrylic acid contained in the separated gases is recovered; f) the catalyst is returned into the regenerator; g) the regenerated catalyst from the regenerator is reintroduced into the first and second reactors; and wherein the catalyst comprises molybdenum, vanadium, tellurium or antimony, oxygen and at least one other element X chosen from niobium, tantalum, tungsten, titanium, aluminum, zirconium, chromium, manganese, iron, ruthenium, cobalt, rhodium, nickel, palladium, platinum, antimony, bismuth, boron, indium and cerium.

Tadamitsu teaches (Translation, page 11, line 10-page 12, line 2) a process for the manufacture of acrolein and acrylic acid from the reaction of propane with a multimetal oxide catalyst in the absence of gaseous oxygen. Tadamitsu teaches (Translation, page 11, lines 10-16) the use of a catalyst having the instantly required composition. Tadamitsu teaches (See Fig. 1) the use of an apparatus having a moving bed of catalyst through which reaction gases move in an upward vertical direction and the use of a catalyst regeneration vessel. Both the catalyst, after regeneration, and product gas containing unreacted starting materials are returned

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to the reaction column for further reaction. Tadamitsu teaches (Translation, page 11, lines 21-24) reaction times and temperatures corresponding to those instantly claimed. Similarly, Tadamitsu teaches (Translation, page 11, lines 21-24) reaction pressures of ~1-2 atmospheres.

The difference between the process of Tadamitsu and that instantly claimed is that Tadamitsu teaches the use of a single reaction column while the use of two is instantly claimed.

Tadamitsu, however, teaches (Page 12, lines 1-2) that only partial conversion of starting materials is achieved in single pass and therefore recycle of the recovered starting materials is appropriate. One of ordinary skill in the art would therefore have been motivated to add an additional reaction column to the apparatus of Tadamitsu in order to increase the contact time between starting materials and catalyst. There would have been a reasonable expectation for success based upon Tadamitsu's teaching of the success of recycling.

Thus the instantly claimed process would have been obvious to one of ordinary skill in the art.

3. Claims 26-29 and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadamitsu et al (JP 03-170445 07-1991, English translation) as applied to claims 17-25 above, and further in view of Dubois (EP 1 238960 09-2002; with references to English equivalent US 6,833,474-B2 12-2004 in **bold**).

Instantly claimed is a process for manufacturing acrylic acid from propane, wherein a) a gaseous mixture devoid of molecular oxygen and comprising propane, water vapor is introduced into a first reactor with a moving catalyst bed; b) at the outlet of the first reactor, the gases are separated from the catalyst; c) the catalyst is returned into a regenerator; d) the gases are introduced into a second reactor with a moving catalyst bed; e) at the outlet of the second reactor, the gases are separated from the catalyst and the acrylic acid contained in the separated gases is recovered; f) the catalyst is returned into the regenerator; g) the regenerated catalyst from the regenerator is reintroduced into the first and second reactors; and wherein the catalyst comprises compounds of the general formula  $\text{Mo}_1\text{V}_a\text{Te}_b\text{Nb}_c\text{Si}_d\text{O}_x$ , and wherein the residence time in each reactor is between 0.1 and 30 seconds.

The difference between the process taught by Tadimitsu and that instantly claimed is that catalysts not specifically contemplated by Tadimitsu are instantly employed.

Dubois, however, teaches (Abstract, **abstract**) a process for the production of acrylic acid from propane in the absence of gaseous oxygen using catalysts of the general formula  $\text{Mo}_1\text{V}_a\text{Te}_b\text{Nb}_c\text{Si}_d\text{O}_x$ . The permissible range of element compositions taught correspond to those instantly claimed. The Examiner also notes that Tadimitsu teaches (Translation, page 8, lines 3-11) residence times within the instantly claimed range.

One of ordinary skill in the art would have been motivated to use the catalysts of Dubois in the process of Tadamitsu because both disclosures are directed to the oxidation of propane to acrylic acid in the absence of gaseous oxygen and Dubois teaches that his catalysts are suitable for the process of Tadamitsu. For the same reason there would have been a reasonable expectation for success.

Thus the instantly claimed process would have been obvious to one of ordinary skill in the art.

#### ***Claim Objections***

4. Claims 30-36 and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Allowable Subject Matter***

5. Claims 30-36 and 40 are drawn to allowable subject matter. The following is a statement of reasons for the indication of allowable subject matter: Neither Tadamitsu et al (JP 03-170445 07-1991, English translation) nor Dubois (EP 1 238960 09-20020) disclose or fairly suggest the use of a co-catalyst of the instantly claimed formula. The instantly claimed process is therefore patentable over the teachings of Tadamitsu and Dubois, the closest prior art.


**Conclusion**

6. Claims 17-40 are pending. Claims 17-29 and 37-39 are rejected. Claims 30-36 and 40 are objected to.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 571-272-0650. The examiner can normally be reached on Monday-Friday 5:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman K. Page can be reached on 571-272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
PAUL A. ZUCKER, PH.D.  
PRIMARY EXAMINER  
